

FLORA OF VIRGINIA: NEW IN THE DECEMBER 2020 UPDATE

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As you will see below, 2012 to 2020 was a long time in terms of our evolving understanding of Virginia's flora!

Many new species are included in this update. Why are all these new taxa making themselves known? Haven't we found out everything yet? Not by a long shot. Native species are occasionally found by intrepid botanists, both amateur and professional, who get out to Virginia's wonderful natural areas. Concurrently, nonnative species continue to naturalize in our anthropogenically influenced landscape. You will also find many new scientific names, not only for some species, but also for genera and families. While field botanists are exploring the outdoors, taxonomists are examining specimens and genetic material to sort out the taxonomic relationships between members of our growing flora.

All this results in a new, richer understanding of Virginia's wonderful and diverse flora. Enjoy!

How to Cite the Flora App Following This Update

The following is the official way in which the current Flora of Virginia (in the form of the App, and including this major update) should be cited in bibliographies and otherwise referred to.

Weakley, A.S., J.C. Ludwig, J.F. Townsend, and G.P. Fleming. 2020. Flora of Virginia. With significant additions and updates. Bland Crowder, ed. Mobile app. Foundation of the Flora of Virginia Project Inc., Richmond, and High Country Apps, Bozeman, Montana.

This is a major update but does *not* make of the Flora a second edition or Flora II.

Family-Level Changes: Net Gain of 13 Families

WE ADDED 13 NEW FAMILIES

3 families are brand-new to the Flora because they comprise nonnative species that are now considered part of our established flora:

- Actinidiaceae; *Actinidia chinense* ssp. *deliciosa* now considered established
- Buxaceae; *Pachysandra terminalis* now considered established
- Cephalotaxaceae; *Cephalotaxus harringtonia* now considered established

The remaining 10 families are the result of advances in taxonomic understanding that resulted in the splitting of families treated in the 2012 Flora into two or more families:

- Aceraceae and Hippocastanaceae out of Sapindaceae
- Alliaceae out of Amaryllidaceae

- Athyriaceae and Cystopteridaceae out of Woodsiaceae
- Chenopodiaceae out of Amaranthaceae
- Heliotropiaceae and Hydrophyllaceae out of Boraginaceae
- Huperziaceae out of Lycopodiaceae
- Mazaceae out of Phrymaceae

WE HAVE NOT DELETED ANY FAMILIES

WE HAVE CHANGED THE NAMES OF 3 FAMILIES

As a result of advances in taxonomic understanding, we are using these new names:

- Viburnaceae; formerly Adoxaceae
- Cymodoceaceae; formerly Ruppiaceae
- Hemerocallidaceae; formerly Xanthorrhoeaceae

Genus Level: Net Gain of 56 Genera

WE HAVE ADDED 75 NEW GENERA

1 genus is new to the Flora because it has a native species now known to be part of our flora:

- *Myrica* (A relict population of *Myrica gale* was found in 2018.)

35 genera are new to the Flora because they have nonnative species that are now considered part of our flora:

- *Actinidia*
- *Aldrovanda*
- *Arum*
- *Bothriochloa*
- *Causonis*
- *Centaurium*
- *Cephalotaxus*
- *Citrullus*
- *Cucumis*
- *Cyrtomium*
- *Desmanthus*
- *Deutzia*
- *Dinebra*
- *Eleutherococcus*
- *Elsholtzia*
- *Facelis*
- *Grindelia*
- *Jacquemontia*

- *Kalopanax*
- *Koelreuteria*
- *Kolkwitzia*
- *Macleaya*
- *Pachysandra*
- *Parapholis*
- *Phellodendron*
- *Pourthiaea*
- *Pseudosasa*
- *Sclerochloa*
- *Sinapis*
- *Stenotaphrum*
- *Styphnolobium*
- *Torenia*
- *Tragus*
- *Tripidium*
- *Ulex*

The remaining 39 genera are new to the Flora because of advances in taxonomic understanding that resulted in the splitting of genera treated in the 2012 Flora into two or more genera:

- *Abdra* out of *Draba*
- *Anchistea* and *Lorinseria* out of *Woodwardia*
- *Anemonastrum* and *Hepatica* out of *Anemone*
- *Andersonglossum* out of *Cynoglossum*
- *Aphyllon*, *Myzorrhiza*, and *Phelipanche* out of *Orobanche*
- *Atocion* out of *Silene*
- *Chenopodiastrum* out of *Chenopodium*
- *Cartrema* out of *Osmanthus*
- *Centunculus* out of *Anagallis*
- *Claytosmunda* out of *Osmunda*
- *Coryphopteris* out of *Parathelypteris*
- *Cyanus* out of *Centaurea*
- *Endotropis* out of *Rhamnus*
- *Erythranthe* out of *Mimulus*
- *Helanthium* out of *Echinodorus*
- *Hexasepalum* out of *Diodia*
- *Hierochloa* out of *Anthoxanthum*
- *Hymenachne* and *Kellochloa* out of *Panicum*
- *Leptoloma* out of *Digitaria*
- *Melanthium* out of *Veratrum*
- *Muscadinia* out of *Vitis*
- *Nanopanax* out of *Panax*
- *Nekemias* out of *Ampelopsis*

- *Oreojuncus* out of *Juncus*
- *Pilosella* out of *Hieracium*
- *Polygaloides* out of *Polygala*
- *Poterium* out of *Sanguisorba*
- *Rhipariosida* out of *Sida*
- *Schoenoplectiella* out of *Schoenoplectus*
- *Spriobassia* out of *Bassia*
- *Steironema* out of *Lysimachia*
- *Triadenum* out of *Hypericum*
- *Trillidium* out of *Trillium*
- *Waldsteinia* out of *Geum*

WE HAVE DELETED 13 GENERA

As a result of advances in taxonomic understanding, the following genera are no longer included in our Flora:

- *Ammophila*; lumped into *Calamagrostis*
- *Consolida*; lumped into *Delphinium*
- *Conyza*; lumped into *Erigeron*
- *Decumaria*; lumped into *Hydrangea*
- *Eichhornia*; lumped into *Pontederia*
- *Kyllinga* and *Lipocarpha*; lumped into *Cyperus*
- *Leptochloa*; reassigned to *Dinebra* and *Diplachne*
- *Nuttallanthus*; lumped into *Linaria*
- *Pennisetum*; lumped into *Cenchrus*
- *Sarcocornia*; lumped into *Salicornia*
- *Schedenorus*; lumped into *Lolium*
- *Vulpia*; lumped into *Festuca*
- *Woodwardia*; reassigned to *Anchistea* and *Lorinseria*

WE HAVE CHANGED THE NAMES OF 11 GENERA

As a result of advances in taxonomic understanding, we are using these new names:

- *Agave*; formerly *Manfreda*
- *Chamaenerion*; formerly *Chamerion*
- *Cubelium*; formerly *Hybanthus*
- *Dactylorhiza*; formerly *Coeloglossum*
- *Diplachne*; formerly *Leptochloa* (in part)
- *Erianthus*; formerly *Saccharum*
- *Mnesithea*; formerly *Coelorachis*
- *Myriopteris*; formerly *Cheilanthes*
- *Noccaea*; formerly *Microthlaspi*
- *Sibbaldiopsis*; formerly *Sibbaldia*
- *Thyrsanthella*; formerly *Trachelospermum*

Species/Subspecies/Variety Level: Net Gain of 186 Taxa

WE HAVE ADDED 192 NEW SPECIES OR INFRASPECIFIC TAXA

The first group, of 113 taxa, presented here in flora order, are nonnatives that have been added. Unfortunately, this list includes many species that are potentially invasive. A couple of these new nonnative taxa do not represent new discoveries but are merely new names due to a taxonomic split.

- *Cyrtomium falcatum*, Asian Net-veined Holly Fern
- *Dryopteris erythrosora*, Japanese Red Shield Fern
- *Cephalotaxus harringtonia*, Japanese Plum Yew
- *Juniperus communis* var. *communis*, European Common Juniper
- *Actinidia chinensis* var. *deliciosa*, Kiwi
- *Amaranthus arenicola*, Sandhill Amaranth
- *Amaranthus viridis*, Slender Amaranth
- *Anthriscus sylvestris* ssp. *sylvestris*, Wild Chervil
- *Spermolepis echinata*, Hooked Spermolepis
- *Ilex cornuta*, Chinese Holly
- *Eleutherococcus sieboldianus*, Fiveleaf Aralia
- *Hedera hibernica*, Irish Ivy
- *Kalopanax septemlobus*, Castor Aralia
- *Ambrosia psilostachya*, Perennial Ragweed
- *Cirsium arvense* var. *horridum*, Prickly Canada Thistle
- *Echinacea purpurea*, Purple Coneflower
- *Facelis retusa*, Trampweed
- *Grindelia lanceolata* var. *lanceolata*, Narrow-leaf Gumweed
- *Pilosella floribunda*, Glaucous Hawkweed
- *Berberis julianae*, Wintergreen Barberry
- *Alnus glutinosa*, Black Alder
- *Lepidium draba*, Hoary Cress
- *Sinapis arvensis*, Charlock
- *Pachysandra terminalis*, Pachysandra, Japanese-spurge
- *Kolkwitzia amabilis*, Beautybush
- *Cerastium pumilum*, Dwarf Mouse-ear Chickweed
- *Sagina procumbens*, Matted Pearlwort
- *Chenopodium murale*, Nettleleaf Goosefoot, Sowbane
- *Jacquemontia tamnifolia*, Common Jacquemontia
- *Citrullus lanatus*, Watermelon
- *Cucumis melo* var. *cantalupo*, Canteloupe
- *Aldrovanda vesiculosa*, Waterwheel Plant
- *Rhododendron minus*, Gorge Rhododendron
- *Euphorbia davidii*, David's Spurge
- *Tragia betonicifolia*, Betony-leaf Noseburn

- *Desmanthus illinoensis*, Bundleflower
- *Lotus tenuis*, Slender Birdsfoot-trefoil
- *Styphnolobium japonicum*, Pagoda Tree
- *Ulex europaeus*, Gorse
- *Wisteria frutescens* var. *macrostachya*, Mississippi Wisteria
- *Castanea mollissima*, Chinese Chestnut
- *Corydalis incisa*, Incised Fumewort
- *Centaureum erythraea*, Common Centaury
- *Centaureum pulchellum*, Lesser Centaury
- *Geranium sibiricum*, Siberian Geranium
- *Ribes missouriense*, Missouri Gooseberry
- *Deutzia scabra*, Fuzzy Deutzia
- *Philadelphus pubescens*, Hoary Mock-orange
- *Callicarpa dichotoma*, Purple Beautyberry
- *Elsholtzia ciliata*, Crested Latesummer Mint
- *Mentha longifolia*, Long-leaved Mint
- *Mentha suaveolens* ssp. *suaveolens*, Pineapple Mint, Round-leaved Mint
- *Teucrium botrys*, Cut-leaf Germander
- *Torenia crustacea*, Malaysian False Pimpernel
- *Trapa bispinosa*, Two-horned Water-chestnut
- *Nelumbo nucifera*, Sacred Lotus
- *Ligustrum quihoui*, Waxy-leaf Privet
- *Osmanthus heterophyllus*, Holly Osmanthus
- *Macleaya cordata*, Five-seeded Plume-poppy
- *Phyllanthus tenellus*, Mascarene Island Leaf-flower
- *Phyllanthus urinaria* ssp. *urinaria*, Chamber Bitter
- *Callitriche stagnalis*, Pond Water-starwort
- *Persicaria extremiorientalis*, East Asian Smartweed
- *Portulaca pilosa*, Kiss-me-quick
- *Rhamnus cathartica*, Common Buckthorn
- *Poterium sanguisorba* var. *polygamum*, Salad Burnet
- *Pourthiaea villosa*, Oriental Photinia
- *Prunus caroliniana*, Carolina Laurel Cherry
- *Rosa rubiginosa* var. *nemoralis*, Eglantine Rose, Sweetbriar
- *Houstonia micrantha*, Small-anthered Bluet, Southern Bluet
- *Phellodendron amurense*, Amur Cork-tree, Japanese Cork-tree
- *Populus nigra*, Black Poplar, Lombardy Poplar
- *Populus* × *canescens*, Gray Poplar
- *Salix cinerea*, Gray Willow
- *Koelreuteria paniculata*, Golden Rain Tree
- *Datura wrightii*, Indian-apple
- *Lycium chinense*, Chinese Matrimony-vine

- *Verbena bracteata*, Prostrate Vervain
- *Viburnum plicatum*, Japanese Snowball
- *Viburnum setigerum*, Tea Viburnum
- *Viburnum sieboldii*, Siebold's Viburnum
- *Causonis japonica*, Bush-killer
- *Narcissus tazetta*, Bunch-flowered Daffodil
- *Narcissus ×incomparabilis*, Nonesuch Daffodil
- *Arum italicum* ssp. *italicum*, Italian Arum
- *Carex praegracilis*, Clustered Field Sedge
- *Carex spicata*, Prickly Sedge
- *Cyperus microiria*, Asian Flatsedge
- *Muscari comosum*, Tassel Grape-hyacinth
- *Alopecurus myosuroides*, Slender Foxtail Grass
- *Bothriochloa bladhii*, Australian Bluestem
- *Bothriochloa ischaemum* var. *songarica*, Yellow Bluestem
- *Bothriochloa torreyana*, Silver Bluestem
- *Bromus erectus*, Upright Brome
- *Bromus rigidus*, Ripcut Brome
- *Bromus scoparius*, Broom Brome
- *Cenchrus purpurascens*, Fountain Grass
- *Diplachne uninervia*, Mexican Sprangletop
- *Festuca bromoides*, European Squirreltail Fescue
- *Hordeum murinum* ssp. *leporinum*, Mouse Barley
- *Hordeum vulgare*, Barley
- *Lolium pratense*, Meadow Fescue
- *Parapholis incurva*, Sickie Grass
- *Phyllostachys aureosulcata*, Yellowgroove Bamboo
- *Phyllostachys bissetii*, Bisset's Bamboo
- *Phyllostachys nigra*, Black Bamboo
- *Pseudosasa japonica*, Arrow Bamboo
- *Puccinellia distans*, European Alkali Grass
- *Sclerochloa dura*, Hard Grass
- *Stenotaphrum secundatum*, St. Augustine Grass
- *Tragus racemosus*, Stalked Burgrass
- *Tripidium ravennae*, Ravenna-grass
- *Urochloa texana*, Texas Millet

The second group, of 74 taxa, presented here in flora order, are natives that have been added to the flora. Many of these new taxa do not represent new discoveries but are merely new names due to a taxonomic split.

- *Asplenium quadrivalvens*, Northern Maidenhair Spleenwort
- *Sanicula canadensis* var. *floridana*, Southern Black Snakeroot
- *Thaspium trifoliatum* var. *aureum*, Yellow-flowered Meadow Parsnip

- *Asarum chueyi*, Chuey's Evergreen Wild Ginger
- *Doellingeria sericocarpoides*, Southern Tall Flat-topped Aster
- *Eupatorium maritimum*, Seaside Thoroughwort
- *Packera crawfordii*, Crawford's Ragwort
- *Pityopsis microcephala*, Narrowleaf Golden-aster
- *Rudbeckia fulgida* var. *umbrosa*, Appalachian Orange Coneflower
- *Rudbeckia hirta* var. *pulcherrima*, Weedy Black-eyed Susan
- *Solidago altissima* var. *pluricephala*, Southern Tall Goldenrod
- *Solidago rugosa* var. *aspera*, Common Rough-stemmed Goldenrod
- *Solidago rugosa* var. *celtidifolia*, Southern Rough-stemmed Goldenrod
- *Solidago rugosa* var. *cronquistiana*, Appalachian Rough-stemmed Goldenrod
- *Solidago rugosa* var. *sphagnifolia*, Bog Rough-stemmed Goldenrod
- *Symphotrichum lanceolatum* var. *latifolium*, Panicked Aster
- *Cardamine longii*, Long's Bittercress
- *Rorippa palustris* ssp. *hispida*, Hairy Marsh Yellow Cress
- *Opuntia cespitosa*, Common Prickly-pear
- *Opuntia mesacantha* ssp. *mesacantha*, Southeastern Prickly-pear
- *Cerastium arvense* ssp. *strictum*, Field Chickweed
- *Minuartia godfreyi*, Godfrey's Sandwort
- *Sedum pulchellum*, Widow's-cross
- *Rhododendron viscosum* var. *serrulatum*, Southeastern Swamp Azalea
- *Vaccinium* × *marianum*, Eastern Highbush Blueberry
- *Galactia brachycarpa*, Sandhill Milkpea
- *Gentiana linearis*, Narrowleaf Gentian
- *Hydrophyllum virginianum* var. *atranthum*, Appalachian Waterleaf
- *Hypericum interior*, Interior Bushy St. John's-wort
- *Scutellaria parvula*, Dwarf Skullcap
- *Myrica gale*, Sweet Gale
- *Fraxinus biltmoreana*, Biltmore Ash
- *Oenothera parviflora*, Small-flowered Evening-primrose
- *Agalinis decemloba*, Ten-lobed False Foxglove
- *Agalinis virgata*, Pine-barren False Foxglove
- *Oxalis colorea*, Small's Wood-sorrel
- *Polygala ambigua*, Loose Milkwort
- *Polygala cruciata* var. *aquilonia*, Northern Drum-heads
- *Persicaria robustior*, Water Smartweed
- *Crataegus pruinosa* var. *virella*, Greenish Frosted Hawthorn
- *Rubus setosus*, Bristly Blackberry
- *Galium tinctorium* var. *floridanum*, Florida Three-lobed Bedstraw
- *Houstonia montana*, Roan Mountain Bluets
- *Ptelea trifoliata* var. *mollis*, Hairy Hop-tree, Hairy Wafer-ash
- *Sagittaria brevirostra*, Midwestern Arrowhead

- *Carex bullata* var. *greenei*, Greene's Sedge
- *Carex projecta*, Necklace Sedge
- *Eleocharis bifida*, Bifid Spikerush
- *Eleocharis tenuis* var. *pseudoptera*, Slender Spikerush
- *Eleocharis verrucosa*, Slender Spikerush
- *Juncus pylaei*, Common Rush
- *Luzula acuminata* var. *carolinae*, Carolina Woodrush
- *Stenanthium gramineum* var. *robustum*, Giant Featherbells
- *Cleistesiosis oricamporum*, Coastal Plain Small Spreading Pogonia
- *Corallorhiza trifida*, Early Coralroot, Northern Coralroot
- *Spiranthes arcisepala*, Appalachian Ladies'-tresses
- *Spiranthes lacera* var. *lacera*, Northern Slender Ladies'-tresses
- *Dichanthelium arenicoloides*, Sandy Woods Panic Grass
- *Dichanthelium bicknellii*, Bicknell's Panic Grass
- *Dichanthelium curtifolium*, Short-leaf Panic Grass
- *Dichanthelium filiramum*, Hairy Needle-leaf Panic Grass
- *Dichanthelium leucothrix*, Rough Panic Grass
- *Dichanthelium mundum*, Elegant Witchgrass
- *Dichanthelium portoricense* ssp. *portoricense*, Puerto Rican Panic Grass
- *Dichanthelium recognitum*, Novel Witchgrass
- *Elymus hystrix* var. *piedmontanus*, Piedmont Bottlebrush Grass
- *Elymus virginicus* var. *halophilus*, Salt-marsh Wild Rye
- *Festuca octoflora* var. *tenella*, Northern Six-weeks Fescue
- *Panicum dichotomiflorum* var. *puritanorum*, Puritan Panic Grass
- *Panicum virgatum* var. *spissum*, Tufted Switchgrass
- *Sphenopholis obtusata* var. *major*, Slender Wedgegrass
- *Potamogeton friesii*, Fries' Pondweed
- *Smilax bona-nox* var. *littoralis*, Maritime Catbrier, Seaside Catbrier
- *Typha* × *glauca*, Hybrid Cattail

4 species have been added whose nativity status is uncertain. For the Weakleaf Yucca, both native and introduced populations are known. For the other three, nativity is unclear.

- *Parthenocissus inserta*, Thicket Creeper
- *Yucca flaccida*, Weakleaf Yucca
- *Yucca gloriosa*, Mound-lily Yucca
- *Cyperus acuminatus*, Taper-tip Flatsedge

Finally, we have included 3 species just documented for Virginia in the fall of 2020; the 2 *Dichanthelium* species are new to science.

- *Azolla filiculoides*, Pacific Mosquito Fern
- *Dichanthelium appalachiense*, Shale Ridge Panic Grass
- *Dichanthelium harvillii*, Harvill's Panic Grass

WE HAVE DELETED 6 TAXA

For a variety of reasons, 6 entries have been deleted:

- *Bromus commutatus*
- *Eupatorium anomalum*
- *Melampyrum lineare* var. *latifolium*
- *Melampyrum lineare* var. *pectinatum*
- *Rhamnus lanceolata* var. *glabrata*
- *Spiranthes sylvatica*

WE HAVE CHANGED THE NAMES OF 284 TAXA

With greater understanding of plant taxonomy, we are clarifying relationships between plants, and this often results in name changes.

Remember the list of splits for all the genera above? When a species' genus changes, so does its name. So, when part of the genus *Panax* is split out into the genus *Nanopanax*, the Dwarf Ginseng, *Panax trifolius*, becomes *Nanopanax trifolius*.

A name change is common when minor differences in a species are examined closely. Often a species exhibits morphological traits that result in its being divided into varieties or subspecies. Sometimes these traits don't hold up to closer examination and are found to be inconsistent or just plain wrong. The varieties or subspecies are no longer considered valid, and an entity is lumped back into the full species. The inverse can happen as well, when taxonomists recognize that a species can be meaningfully divided into varieties or subspecies.

Sometimes varieties or subspecies of a single species are considered sufficiently distinct to warrant full species status.

Sometimes there is a minor change to a name. For example, Goldie's Fern was *Dryopteris goldiana*, but the specific epithet has been changed to *goldieana* in the update to reflect the correct spelling of Dr. Goldie's name. ■